

Antenna Report

Radiation Characteristics of antenna located into a Host Platform

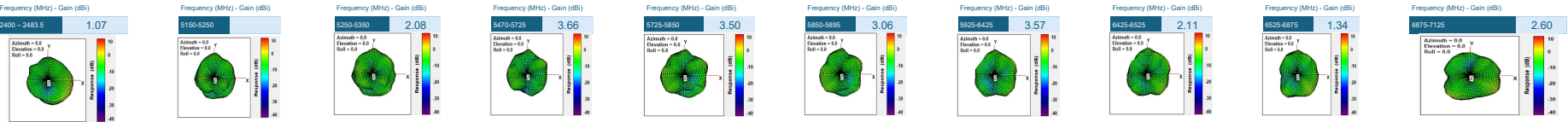
Antenna Peak Gain and VSWR w/ cable loss (dBi) ¹											2400 ~ 2483.5 MHz 5150-5250 MHz 5250-5350 MHz 5470-5725 MHz 5725-5850 MHz 5850-5895 MHz 5925-6425 MHz 6425-6525 MHz 6525-6875 MHz 6875-7125 MHz																
Antenna Cycle	OEM	ODM	Host Platform Name	Host Platform Type	Intel Platform	Antenna-Manufacturer	Antenna-Type	Antenna-PN	Antenna Main/Aux	SAR min separation (mm)	WiFi-Module	Applicable Certification	SAR FCC (SED C1/PC Apply)	Antenna Metrics ²	2.4 GHz	5.2 GHz	5.3 GHz	5.6 GHz	5.8 GHz	5.9 GHz	6.2 GHz	6.5 GHz	6.7 GHz	7.0 GHz	圖1	圖2	圖3
		Pegatron	Thorpe		Yes	Pulse	PIFA	TZ31840	Main/Ant.2					Gain	1.07	2.08	2.08	3.66	3.50	3.06	3.57	2.11	1.34	2.60			
		Pegatron	Thorpe		Yes	Pulse	PIFA	TZ31844	Aux/Ant.1					Gain	0.30	1.79	1.79	0.94	2.21	2.21	1.30	1.06	1.91	2.00			
		Pegatron	Thorpe		Yes	Pulse	PIFA	TZ31840	Main/Ant.2					VSWR	1.67	1.77	1.60	1.97	1.97	1.83	1.86	1.80	1.55	1.78			
		Pegatron	Thorpe		Yes	Pulse	PIFA	TZ31844	Aux/Ant.1					VSWR	1.35	1.63	1.70	1.95	1.94	1.57	1.79	1.13	1.70	1.67			

1: 3D Antenna Peak Gain required being test in system basis

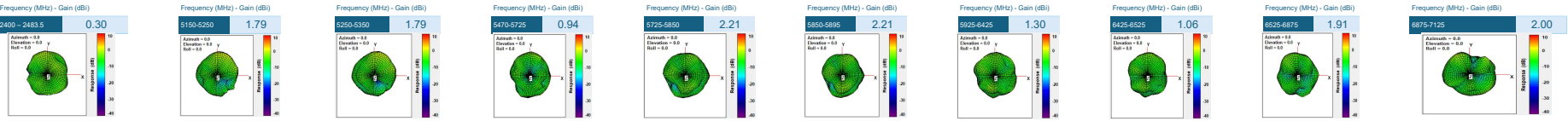
2: Maximum VSWR level required by the Wi-Fi module vendor to ensure proper antenna matching is 2 (S11 < -10 dB) for dual band LBNB modules and 2.32 (S11 < -8 dB) for triple band LBNB/UHB modules

3D Peak Antenna gain should be equal or greater than -2 dBi. If a host integrator plans to use a lower gain antenna of the same type, additional CBP(FCC)/EDT(EU) testing need to be performed while the module is installed in the host.

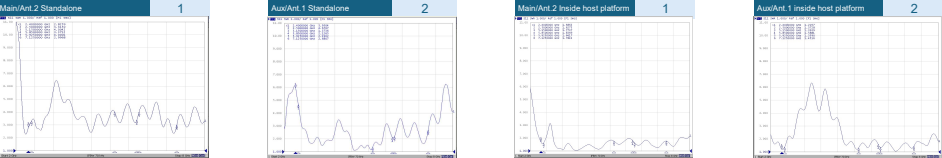
Max Antenna 3D Radiation Pattern - Main Antenna / Ant.2



Max Antenna 3D Radiation Pattern - Aux Antenna / Ant.1



Antenna VSWR data plot inside and outside a host Platform (standalone)



Maximum VSWR level required by the Wi-Fi module vendor to ensure proper antenna matching is 2 (S11 < -10dB)

Mechanical Information

Antenna Location for SAR evaluation Cable Assembly

Include a dimensional photo(s) or dimensional drawing(s) showing the distance (mm) between the forward antenna and the user. For notebook/laptop tests show laptop position (example below). For tablet tests show all connections including laptop, primary & secondary port(s), primary & secondary network cables. Include a description of any proximity sensors or power shielding implemented that limit or exclude use of any host interfaces.

Tablet mode-Please refer Annex A

Pin	Length	Dimensions	Impedance	Connector
Main	100mm	1.13 Super LLS	50Ω	PEA-20005
Aux	150mm	1.13 Super LLS	50Ω	PEA-20005

Main/Ant.2 Drawing	Aux/Ant.1 Drawing	Main/Ant.2 Front	Main/Ant.2 Back	Aux/Ant.1 Front	Aux/Ant.1 Back
Please refer Annex A	Please refer Annex A	Please refer Annex A	Please refer Annex A	Please refer Annex A	Please refer Annex A

Measurement Method and Test System Description Photographs Test Equipment List

Include a dimensional photo(s) or dimensional drawing(s) of Main and Aux antenna placements (measurements are not required for receive-only antennas). Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas, for example, non-conductive plastics vs. conductive coated plastic or metallic materials.

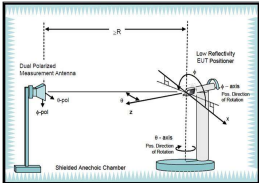
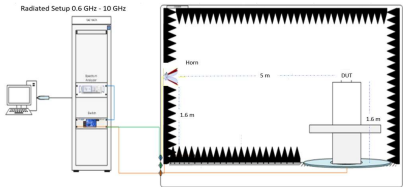
- The gain measurement shall follow by following conditions:^{1,2}
 - It is required that all the antenna gain to be measured spherically and computed by spatial average be computed of the resultant gain.^{1,2}
 - During gain measurement, all other antennas not under test should be terminated by 50 Ohm load in end of cable.^{1,2}
 - Space points of 3D gain measurement are increase by specific steps from Theta 0~180 degrees, and Phi, 0~360 degrees, as figure below. The increments steps are different steps are different by antenna functions.^{1,2}

Theta Start ^{1,2}	0 degree ^{1,2}	Phi Start ^{1,2}	0 degree ^{1,2}
Theta Stop ^{1,2}	180 degree ^{1,2}	Phi Stop ^{1,2}	360 degree ^{1,2}
Theta Increment ^{1,2}	30 degree ^{1,2}	Phi Increment ^{1,2}	30 degree ^{1,2}

^{1,2}

3.2 Test setup:

The testing of antenna gain should be made at a ETS qualified lab with an RF anechoic chamber with at least 5-meter separation from the receive antenna to the antenna under test. The antenna gain report from unqualified lab can't be referenced a passing. Besides, all test equipment including horn antennas, adapters, cables, network analyzers, and receivers shall be calibrated per manufacturer's minimum calibration requirements.^{1,2}



Please refer Annex A

Test location	Probe
Company name	No.51, Jing 6th Road, N.E.P.Z., Neihujiang 81170, Taiwan (R.O.C.)

Test Personnel	James Hu
Name of test person	James Hu@ngn.com
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Test Mobile	
Testing date	2020/07/01